CLAIMS

What is claimed is:

1. A heat dissipating structure, comprising:

a composite having a thermal expansion coefficient between 30 °C and 250 °C in a range from 2 to 13.10^{-6} K^{-1}, a volume mass of less than 3000 $kg \cdot m^{-3}$, and a conductivity equal to or greater than 113 $W \cdot m^{-1} \cdot K^{-1}$, said composite including a matrix component made of a material selected from the group consisting of metal, polymer, and resin, and a reinforcement component, which contains microfibers at a volume proportion in a range from 5 to 90% and nanofibers at a volume proportion from 1 to 60%, wherein the composite is obtained through infiltration of the reinforcement component with the matrix component; and

a surface layer applied onto the composite and having entirely or at least partially a metallic character.

2. The structure of claim 1, wherein the matrix component is metal and infiltrates the reinforcement component in liquid state, or the matrix component is polymer or resin in liquid or uncured state for infiltrating the reinforcement component.

3. The structure of claim 1, wherein the metal is selected from the group consisting of pure aluminum, pure magnesium, pure copper, and alloys thereof.

4. The structure of claim 1, wherein the matrix is made of a copper-tungsten composition or copper-molybdenum composition.

5. The structure of claim 1, wherein the surface layer is made of metal or a metal alloy.

6. The structure of claim 1, wherein the metal or metal alloy is made of a material selected from the group consisting of Ni, Cu, Au, Ag, Ti, Al, V, Mo, W, and alloys thereof.

7. The structure of claim 1, wherein the surface layer is made entirely, or at least partially, of a material selected from the group consisting of Ni, Ni-B, Ni-P, and NI-alloys.

8. The structure of claim 1, wherein the surface layer is applied by at least one process selected from the group consisting of electrochemical process, chemical process, and physical process.

9. The structure of claim 1, wherein the surface layer is applied by an electrochemical process.

10. The structure of claim 1, wherein the surface layer is applied by sputtering.

11. The structure of claim 1, wherein the surface layer is applied by roll-bonded cladding.

12. The structure of claim 1, wherein the surface layer is applied at a thickness of few nanometers to few millimeters.

13. The structure of claim 1, wherein the surface layer is applied at a thickness of few microns.

14. The structure of claim 1, wherein the surface layer is textured.

15. The structure of claim 14, wherein the surface layer is textured through an etching process.

16. The structure of claim 1, wherein the composite contains 5 to 90% of carbon fibers at a diameter of greater than 1 μm.

17. The structure of claim 1, wherein the composite contains 5 to 90% of carbon fibers at a diameter of 5 to 15 μm.

18. The structure of claim 1, wherein the composite contains 1 to 90% of microfibers at a diameter of less than 5 μm.

19. The structure of claim 16, wherein the carbon fibers are made of at least one material selected from the group consisting of graphitized polyacrylnitrile and pitch.

20. The structure of claim 16, wherein the carbon fibers are incorporated in the matrix one-dimensional or in a form of a two-dimensional or three dimensional network.

21. The structure of claim 1, wherein the composite contains 1 to 60% of nanofibers at a diameter of less than 1 μm.

22. The structure of claim 1, wherein the composite contains 1 to 60% of nanofibers at a diameter of less than 300 nm.

23. The structure of claim 1, wherein the composite contains 1 to 60% of carbon nanofibers sized at a diameter of smaller than 300 nm and obtained through catalyst-supported extraction of carbon from a gas phase.

24. The structure of claim 23, wherein the carbon nanofibers have a hollow inner channel.

25. The structure of claim 23, wherein the carbon nanofibers contain at least one element selected from the group consisting of boron and nitrogen in addition to carbon.

26. The structure of claim 1, wherein the composite contains 1 to 60% of a material selected from the group consisting of boron nanofibers or BN-nanofibers at a diameter of less then 300 nm.

27. The structure of claim 1, wherein the composite contains 1 to 60% of nanofibers sized at a diameter of less than 300 nm and made of a material selected from the group consisting of MoS_2, WS_2, NbS_2, TaS_2, and V_sO_5, in the form of multi-walled nanotubes.

28. The structure of claim 1, wherein the composite contains 1 to 60% of nanofibers made of a single atomic layer in the shape of a tube.

29. The structure of claim 1, wherein the composite contains 1 to 90% of microfibers sized at a diameter of greater than 1 μm and less than 5 μm, and made of glass or ceramics.

30. The structure of claim 29, wherein the microfibers have a continuous metallic layer.

31. The use of a structure according to claim 1 for heat separation.

32. The structure of claim 1, and further comprising a cooling element attached to the structure and circulated by a liquid.

33. The structure of claim 1, configured as a cooling element through which a liquid circulates.

34. The structure of claim 1, configured as heat pipe.

35. The structure of claim 1, configured as attachment to a heat pipe.

36. The structure of claim 1, wherein the structure is provided with cooling ribs through which a gas circulates.

37. The structure of claim 1, configured as a chip cover.

38. The structure of claim 1, configured as a base plate for an IGBT.

39. The structure of claim 1, configured as a base plate for a thyristors.

40. The structure of claim 1, configured as a base plate for a laser diode.

41. The structure of claim 1, configured as an electronic casing.

42. The structure of claim 1, configured as a hermetically sealed casing.

43. The structure of claim 1, configured as a carrier or construction material and able to withstand changing thermal loads.

44. The structure of claim 1, and further comprising a matrix metal poured about the composite having a core of metal matrix.